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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

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First Adventure

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Edited by WATSON DAVIS

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DO YOU KNOW?

A land snail moves at a speed of about a mile a month.

The U. S. Lighthouse Service has a fleet of over 40 lightships.

Dentist's cement makes neat, almost invisible brackets on which to mount bottled exhibits, one museum has found.

The oldest known objects of meteoric iron, reports G. A. Wainwright, are beads which he found in Egypt, from 3500 B.C. or earlier.

A boxing match was recently broadcast by television in Soviet Russia, and state officials plan transmission of circus performances and opera scenes.

Australia has found that her wild flowers can be shipped frozen in big blocks of ice to flower shows in England and other distant countries.

Unlike most horses, the Morgan horse and the Arabian have only five lumbar vertebrae, instead of six, and this supports the theory that Morgan and Arabian horses are related.

Florida has a number of disappearing lakes, which come and go because of peculiar geologic conditions.

An attempt is being made to have engineering degrees conferred by universities more uniform in name and requirements.

By examining the stomach contents of fur-seals, it is shown that these seals are not destructive to the salmon and halibut fisheries.

The industry of growing tulip bulbs is found to be suited to almost any part of the United States where soil and climate are favorable for oats.

In the cornerstone of a New York building, for future generations to examine, are sound records of auto horns, newsboy shouts, and other traffic noises.

A "brown" snow that fell in February in New England apparently got its brown color from Oklahoma, Texas, or Kansas, judging by the quality of the dust.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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AERONAUTICS

World's Largest High Speed Wind Tunnel Just Developed

Only Glass Engine Cylinder, Through Which Scientists Can Watch Combustion, Among Sights at Langley Field

By ROBERT D. POTTER

DRONING airplanes overhead, guards at the gates and the colorful routine of an army post may catch the eye of the visitor at the Army's aerodrome at Langley Field, Va., but research which keeps those planes in the air and makes them continually better and faster is the more important scientific function.

In giant wind tunnels that can swallow an army pursuit plane and drive an airstream at it with staggeringly high velocities, the research scientists of the National Advisory Committee for Aeronautics are learning new facts which will soon be applied to military and civil aircraft.

Just a few samples are:

(1) A new type engine cowling which may yield additional miles per hour of air speed.

(2) New type wing section which will not go into a dangerous roll at stalling speeds.

(3) Diesel engines which weigh no more per horsepower developed than does a standard aviation internal combustion engine.

(4) Improved hull design for seaplanes which provides faster takeoff.

(5) Studies of airship structural faults.

(6) The magnitude of hitherto unforeseen forces which an airship may encounter in landing and takeoff.

The list might be continued almost indefinitely but the visitor on a hurried tour of the N.A.C.A. laboratories needs ever to keep the broad improvements in mind and avoid becoming lost in detail.

Major new device now available for research at Langley Field is the world's largest high speed wind tunnel, just completed at a cost of several hundred thousand dollars. Driven by a great 8,000-horsepower motor and fan, air can be rushed at large models of aircraft, or whole propellers, with speeds which approach the velocity of sound. High speed wind tunnels have existed before but their size permitted the use of only toy-like models two feet across at the most. N.A.C.A., in fact, has two such tunnels. But now models of eight-foot wing span can be sent through their research paces in the new structure.

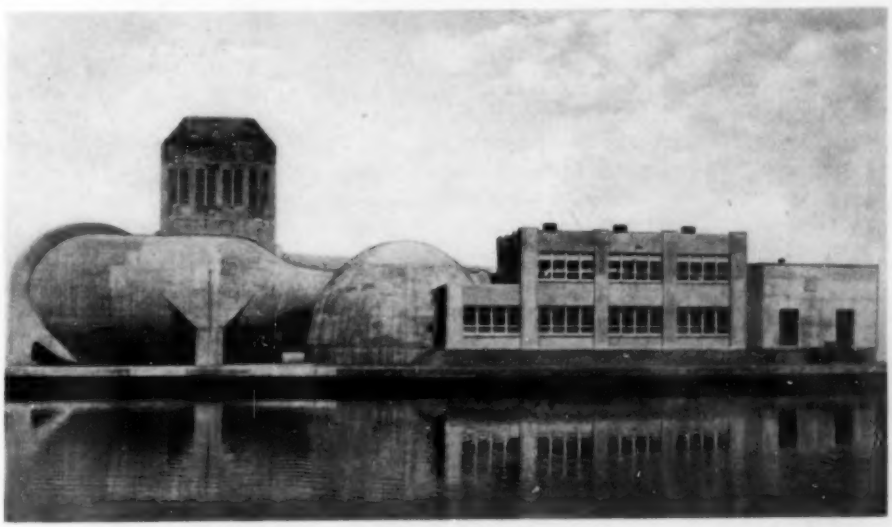
Advantage of using large scale models lies in the fact that what scientists find out on tiny models may not be true on a real plane in actual flight. The uncertainty of this occurrence—which scientists call the scale effect—is a problem which research is continually trying to solve. The new wind tunnel shown to military and civil aeronautical engineers at the recent N.A.C.A. conference is expected to provide new insight on aircraft research never before possible to attain. The very fact that the air speeds are higher than the world's record speed of aircraft and swifter also than the velocity attained in the hazardous power test dives is only one point indicative of the usefulness of the new development. Air stream velocities of over 500 miles an hour are possible in the device.

Particularly vital in connection with the present trans-Pacific oceanic seaplane flights and the imminent establishment of a similar service over the Atlantic, are studies at the half-mile long towing tank at the Langley Field Laboratories.

Here the visitor mounts the electric towing mechanism from whose bottom surface hangs a six-foot model of a seaplane float exact in every proportion with a real seaplane hull. The sweep of the bow, each and every rivet on the outer surface and the angle of the step, all are properly to scale.

At a signal the overhead towing car starts down its track. Slowly it starts at first like a real seaplane in takeoff. Then its speed increases to 30 and 45 miles an hour. The hull tilts back on the "step." The waves become larger and finally the measuring instruments tell that the hull (providing wings were attached) would take off in flight. And all the while the visitor keeps peering at the swiftly approaching end of the tank to see if he, personally, is going to crack up. But the brakes are applied in time and the hull is then returned for another run.

Maybe a similar hull, except that the rivets are flush with the surface, is next put through its paces and the scientists can measure the lessened amount of friction, and the much shorter takeoff distance required to permit such a hull to take the air. (*Turn to page* 362)



N.A.C.A. Photo.

GIANT WIND TUNNEL

Giant high speed wind tunnel at the research laboratories of the National Advisory Committee for Aeronautics at Langley Field, Va. In the beehive-shaped domed structure in the center is the test chamber where eight-foot models of aircraft can be tested in an airstream having a velocity well over 500 miles an hour. Size of the unit is shown by the adjacent two story building and the automobile seen at the lower right. Made of steel and concrete, the walls of the tunnel and the test chamber are two feet thick. In use the dome must withstand an external air pressure having a total force of 1,500,000 pounds.

ENGINEERING

Test Human Ability to Stand Motor Car Vibrations

Human Ear, Not Modern Instruments, Is Final Judge Of Noise In Annoying Quality of Auto Noise

TRANSVERSE vibration, or sidesway, causes motor car riding annoyance quicker than any other type of vibration, it was disclosed at the meeting of the Society of Automotive Engineers in White Sulphur Springs, W. Va.

Prof. H. M. Jacklin, Purdue University authority, told of his studies of motor car vibrations with an instrument for measuring accelerations. The apparatus turns mere human guesses about riding comfort into facts and figures.

First using a shaking table in his laboratory and test subjects seated on hard-type rattan street car seats, Prof. Jacklin found the following comparison between the three possible types of vibration—transverse (sidesway), longitudinal and vertical.

Vertical	31.20
Longitudinal	4.02
Transverse	2.35

The figures represent an arbitrary scale devised by Prof. Jacklin which gives a measure of vibration tolerated with only "disturbing" results. The important thing is that the human body will tolerate nearly twice as much longitudinal vibration as transverse, and nearly 15 times as much vertical vibration as transverse or sidesway.

Going from the laboratory to driving in real cars, Prof. Jacklin used a specially chosen test group of observers whose records in the laboratory indicated that they were most nearly normal in their reactions to riding discomfort.

"Disturbing"

Particular attention was given to "disturbing" vibrations which Prof. Jacklin defines as, "You note that certain organs or parts of your body have greater vibrations than you yourself, and you try to prevent this by tightening certain muscles."

Tests with the accelerometer showed that the maximum average acceleration tolerated before the "disturbing" conditions set in was one having a rating of nearly 10 feet per second. This is almost one-third of the acceleration of gravity in a free falling body, as if one jumped off a building. It is essentially the same acceleration used in the most modern of high-speed elevators.

Practical applications of his studies have already been made, said the Purdue professor. Special sponge rubber seats have been used to determine how they absorb the annoying vibrations. Using small vents in the sides of such seats, so that they act as bellows, it has been found that holes only one-quarter of an inch in diameter give best riding results.

Marked differences between old and new model cars were also found. Particularly good in its riding characteristics was a small German car having its motor in the rear. "It would seem that there may be real possibilities in this type of construction if the car were built of a size suitable for the American public," concluded Prof. Jacklin.

Ear is "Supreme Court"

Despite all the modern sound analyzing instruments and learned talk of decibels, it is ultimately the ear of the motor car purchaser which decides whether the family's new automobile is noisy or not.

This, in essence, was the warning presented by John S. Parkinson of the Johns-Manville Research Laboratories.

Because it is the motor car owner who decides the apparent noises of an automobile (with the resultant reaction on sales) Mr. Parkinson described to his fellow automotive engineers the role of the ear as a noise-measuring instrument.

After discussing the role of sound pitch and intensity as factors of noise production, the speaker added:

"It is a curious fact that the annoyance caused by a sound is also very intimately related with the hearer's opinion as to whether the sound is necessary. There is evidence of this from everyday experience. A rattle or a squeak which does not appear to be necessary is considerably more disturbing than the ordinary engine noise which we always hear, even though this latter noise may be considerably louder. Unfortunately we have no instrumental means of measuring such uncertain psychological factors as this."

But while stating that the car owner's ears were the final court of judgment on car noises, Mr. Parkinson urged wider use of sound analyzing devices so that studies could be made of the various pitches of sounds produced by an automobile.

All manner of high and low pitched sounds are present, he explained, but it has been found that the noise only becomes annoying when the high pitches predominate. Low pitch sounds or a composite of sounds without any one frequency being predominant are the best compromise, he declared.

"Automobiles will never be quiet," Mr. Parkinson added, "but must always be quieter." Paradoxical as this may seem at first, it means that engineers must so balance and mix the known automobile noises so that the effect to the ear is less annoying and thus, in effect, quieter.

Airplane Research

In contrast to Mr. Parkinson's report on blending sounds to reduce the apparent noise was the address of S. J. Zand, American engineer who has served as aviation acoustical consultant for both the French and Italian governments.

As acoustical expert for the Sperry Gyroscope Company on soundproofing airplane cabins, Mr. Zand frankly told the automotive engineers that they could reduce the noise level inside a modern motor car by 40 per cent if they wished to take advantage of what has been learned in the much more difficult field of aeronautical research.

Quieting cars would be a much easier problem than soundproofing airplane cabins located within a few feet of one of the most powerful sources of noise known to man—the airplane propeller.

The fact that cars are still noisy, Mr. Zand intimated, can be explained only by the fact that the automotive industry is not willing to appropriate sufficient funds to accomplish a thorough study of automotive acoustics. He went on to explain how such acoustical research might be carried out, emphasizing the fundamentals of acoustical phenomena.

Next Year's Car

What will America's motor cars for 1937 look like?

No one at the meeting of the Society of Automotive Engineers gave a specific answer to the question, but behind-the-

scene facts about the stages by which automobile designers arrive at their final model were revealed by George J. Mercer, consulting body engineer of Detroit.

Here is an approximate recipe for producing next year's motor:

Conservative Plus Radical

Take one part each of conservative body designer and artist with radical design tendencies. Let them produce drawings of what they would like the new car to look like on the assumption that the factory can produce anything. Then add two parts "practical" engineers who can season the extreme designs with knowledge about tool and die costs. Mix in a dash of public opinion as determined by questionnaires and test the mixture on a small group of executives.

Strange as this procedure may seem, it is one method of arriving at the new models. Inherent difficulty is that few people, either in the industry or out, have any concrete ideas of what they want. In the main they can only tell what they don't want, Mr. Mercer indicated.

Napoleon's comment that the only thing worse than an army with a poor general was an army with two good ones is equally applicable to body design, said Mr. Mercer. Final decision on the body style choice must be left to a small committee which may well have one woman member.

Final step in production is spreading the work out as widely as possible so that secrecy may be preserved. The idea is that while many people may know a few details it will be difficult for a competitor to get enough pieces of information together to make sense.

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ORNITHOLOGY

First Adventure of Young Robins Pictured

See Front Cover

JUST a couple of young robins, big enough to leave the nest but not quite ready yet to "go it alone" in the wide world provide the subject for the front cover illustration of this week's SCIENCE NEWS LETTER. They hang onto their twig with all the grip there is in their small toes—for there may be a cat on the ground. The photo is from the camera of Cornelia Clarke.

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MODEL OF COMPLEX MOLECULES

With aluminum spheres whose relative sizes accurately picture the sizes of the different atoms chemists can now foretell whether they can build up complex organic molecules. Above, the chemist's hand is trying to add a large iodine atom to an already complicated molecule. Because the iodine atom is so big, it will not join on to the model at its proper place. Thus the chemist knows he cannot prepare the compound known as 5-iodo-4-nitro-phenanthrene, except perhaps in an indirect way. Dr. R. E. Steiger of Swarthmore College developed the molecular models.

CHEMISTRY

Large Models of Molecules Predict Chemical Facts

By DR. W. E. DANFORTH, Bartol Research Foundation of the Franklin Institute

A WATCH designer, in order to facilitate his work, may construct a model several times larger than the finished time-piece will be.

How convenient it would be for the organic chemist if he, likewise, could enlarge the molecules with which he deals to a size of several inches. Instead then of vainly attempting for months to prepare a certain compound, he could have seen at the outset that the method he was using could not possibly lead to the desired result.

The organic chemist is always anxious to know just how closely atoms or groups of atoms, appearing in the molecules of a compound, approach each other in space. With this knowledge he could foresee whether or not certain phenomena would take place.

To represent organic molecules correctly, models should be composed of spheres made to the scale of the atoms with a properly chosen magnification. Moreover, the spheres should not be separated by rods as are those in the old-type models.

This has been fully realized by Dr. Robert E. Steiger of Swarthmore College. His "Organospheres" are 172,410,000 times the actual size of the nonmetallic atoms one is most likely to find in organic substances. Made of solid aluminum, they can be connected to each other, at specific points ("valence points") on their surfaces, by means of pins which are no longer visible once the connection has been effected.

To speed up construction of the desired models, complete sets of Organospheres contain assemblages of two or more spheres corresponding to the groups of atoms most frequently occurring in organic compounds.

George A. Bourdelais of the Engineering Division of Swarthmore College deserves great credit for having successfully solved the serious technical diffi-

culties encountered in the making of the Organospheres, thus having provided organic chemists and teachers with an effective tool for research and demonstration work.

But how, one may ask, do scientists know how large the atoms are? This is accomplished with X-rays by examining the reflected pattern produced when a beam of X-rays is shot into a crystal of the substance in question. In addition, the models themselves may furnish considerable information as to the sizes of real atoms. For, if certain molecules are known to exist and to behave in a certain way, the models may show that this behavior is only possible when the sizes of some of the atoms lie within narrow limits.

In this way, Dr. Steiger was able to assign to the hydrogen atom attached to an aromatic ring a radius of 0.00000000173 inches (0.44 Angstrom units). Several months later, an English scientist, Dr. P. L. F. Jones, obtained exactly the same value by a more direct method.

Dr. Steiger is now engaged in research to prove that several rather simple compounds must be mixtures of optically active modifications because they are not at all symmetrical in structure as is generally believed.

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From page 359

Over in the engine research laboratory the visitor stands speechless in the face of roaring engines. Here is the newest thing in Diesel engines, which weighs no more per horsepower developed than do the best internal combustion engines now in use.

Study Diesels

In the not-too-far distant future it may lead to the design of Diesel engines for airplanes and airships; the latter if the nation decides to go into the business of building them again. In the meantime the research engineers of the N.A.C.A. are studying Diesels from all possible angles to be ready if and when matters of policy are decided by government officials at Washington.

Typical of the advanced research is the world's only glass engine cylinder, whose walls are accurately ground to within a ten-thousandth of an inch, into which the scientists can peer and watch what really happens when the air and fuel surge into the firing chamber. Slow motion "movies" of these cylinder eddy currents are made when the engine is turning over at 1,500 revolutions per minute. Actual firing of the charge does not occur, but already much has been learned about the proper design of fuel nozzles and other problems.

To Prevent Roll

A new type of airplane wing section has been developed which avoids the hazards of wing-tip stalling when a plane tries to climb too fast. In the ten-foot diameter wing tunnel the N.A.C.A. scientists show the visitors visible proof of this development.

Tiny silk threads are mounted on the upper wing surfaces of an airplane model. In level flight the airstream flows smoothly over the wings and the threads lie flat. Then a concealed robot pilot mechanism within the model tilts the plane upward as in a steep climb. Immediately the threads near the wing tips start to flutter, showing that lift has been lost on those surfaces.

The torque created produces a roll which the controlling ailerons on the wings may not be able to counteract. The visitor shudders and is glad the model is not a real plane with him in it.

But then the new type N.A.C.A. wing is placed on the model and the same experiment performed. This time stalling, as shown by the fluttering silk threads starts near the body of the airplane instead of near the wings. Instead of rolling round and round the model merely oscillates slightly and only a vigorous push on one wing sets up the roll. As soon as the robot pilot in the model restores the controls to the normal position the plane comes out of its rolling flight.

Highly technical but vitally important for still higher airplane speeds are studies of what aeronautical scientists call "skin friction." This is the resistance of an airplane's surface even after all protruding parts have been suitably streamlined. Skin friction depends on the presence of a turbulent flow of air across the wings instead of a smooth flow. If the turbulent flow could be overcome on the wings of a large modern transport plane, the drag of the wings, which is ordinarily about 550 pounds, could be reduced to 100 pounds drag instead. The gain in speed, greater pay load and all the other factors whose improvement would come with reduced "skin friction" drag, offer a major airplane research objective.

Using model cross-section of wings and smoke, N.A.C.A. scientists are now studying the particular conditions which turn the smooth flow into the dragging turbulent flow. Here again wind tunnel research is vital.

So multitudinous are the research projects at Langley Field that the visitor is truly amazed. The significance of much of the work cannot immediately be grasped. Some of it, of military necessity, cannot be shown. But from it all one goes away with a wholesome respect for little-mentioned research which has aided materially in bringing American aviation to its present high stage of development and which—skill and appropriations permitting—will continue to keep it there.

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MEDICINE

Process for Making Milk Safe for Allergy Patients

A MILK which sensitive, or allergic infants and grown persons, who break out into an eczema-like rash every time they drink ordinary milk, could imbibe without any ill effects is described in a patent (No. 2,036,404) granted to W. O. Frohring, of Shaker Heights, Ohio.

The milk is pleasant, appetizing and agreeable to take, especially when sweetened with sugar, says the inventor, who has assigned his patent to the S.M.A. Corporation, producers of special baby milks.

Whole-milk, skim-milk and cream, he claims, may all be made non-allergic by his unique method. The non-allergic milk can take the place of egg yolk in making mayonnaise, states the patent, and egg-allergic persons who are sensitive to mayonnaise made with egg yolk can eat to their hearts' content of the non-allergic product.

Proteins contained in milk, such as casein, albumin and globulin, are blamed for inducing symptoms in allergic infants and adults. Giving milk a special heat treatment, the inventor has found, seems to eliminate or reduce the allergy-inducing tendencies of these proteins.

In applying this heat treatment, ordinary pasteurized milk is first poured into containers which are then sealed to keep air out. The sealed milk is then heated to a temperature of between 240 and 242 degrees Fahrenheit for about two hours. That is all there is to the process. The treatment kills spores and bacteria, and more important, without any apparent breakdown of the proteins, it changes them so that the milk becomes safe for milk-allergic persons to drink.

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SEISMOLOGY

Violent Earthquake Centered In Northern Part of India

"Lost" Catastrophe, News of Which Has Been Delayed, May Have Centered in the Himalaya Mountains

A VIOLENT earthquake wrenched the Himalaya mountains of Northern India on Wednesday morning, May 27. It is possible that some loss of life and property damage occurred, though the region most seriously affected is not very densely populated.

Direct word from the shaken area has not yet come out by cable or radio, but the occurrence of the earthquake was assured by reports from seismological observatories in the United States, Canada, the Philippines, and China, forwarded to Science Service and interpreted by scientists of the U. S. Coast and Geodetic Survey. A brief cable dispatch from Calcutta stated that an earthquake had been felt there, but no damage was mentioned.

Near Mt. Everest

The earthquake most probably centered a long distance to the northwest of Calcutta, calculations by the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association indicated. The epicenter was at about 29 degrees north latitude, 84 degrees east longitude, some 200 miles from Mt. Everest. Because of the remoteness of this region from modern communication networks, it may be weeks before direct news is brought to the world.

The quake started at 11:19 a.m., local time, or 1:46 a.m., U. S. Eastern Standard Time, on Wednesday morning.

The entire northern part of India is subject to frequent and powerful earthquakes. Just a few days less than a year ago, on May 31, 1935, the most disastrous earthquake that has visited India within historic times completely wiped out the city of Quetta, near the border of Baluchistan, far to the west of the region of Wednesday's quake.

Stations reporting seismological data to Science Service were the Manila Observatory, Manila, P. I., the Zikawei Observatory, near Shanghai, China; Phulien Observatory, in China; the Dominion Meteorological Observatory at Victoria, B. C.; the observatories of the Jesuit Seismological Association at Georgetown University, Fordham University, and Canisius College; and the observatory of the U. S. Coast and Geodetic Survey at Tucson, Arizona; Honolulu, T. H., and Fairbanks, Alaska.

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SEISMOLOGY

Earthquake Recorded From Solomon Islands

AN EARTHQUAKE officially described as a "very strong shock," occurred at the Solomon Islands in the South Pacific Ocean on May 19 at 10:05 p.m., eastern standard time. From earthquake data assembled by Science Service, seismologists of the U. S. Coast and Geodetic Survey located the quake's epicenter at about 8.5 degrees south latitude, 160 degrees east longitude.

Reports to Science Service were sent from Manila Observatory in the Philippines, the Dominion Meteorological Observatory at Victoria, B. C., St. Louis University, the University of Wisconsin, Fordham University, the University of California, Georgetown University, Canisius College, and the stations of the U. S. Coast and Geodetic Survey at Ukiah, Calif., and Tucson, Ariz.

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SEISMOLOGY

Pacific Ocean Bottom Has Its Own "Lost" Quake

ON THE heels of the "lost" earthquake of northern India, came another earthquake, "lost" for a different reason—because it happened beneath the bottom of the sea. On Friday morning, May 28, at 1:48.7, eastern standard time, a sharp shock jarred the sea bottom in the Pacific, about 700 miles southwest of Lower Mexico and about 1,700 miles due west of the Canal Zone.

Its geographical coordinates were eight degrees north latitude, one hundred four degrees west longitude, as calculated by seismologists of the U. S. Coast and Geodetic Survey. The Jesuit Seismological Association announced that the actual focus of the quake was 300 kilometers below the earth's surface.

Stations reporting to Science Service were those of the Dominion Meteorological Observatory, Victoria, B. C.; the Dominion Observatory, Ottawa, Ont.; the private observatory of Mrs. M. M. Seeburger, Des Moines, Iowa; Georgetown University, Fordham University, Canisius College, Pennsylvania State College, the University of California, Manila Observatory, and the observatories of the U. S. Coast and Geodetic Survey at Tucson, Ariz., Honolulu, and Chicago.

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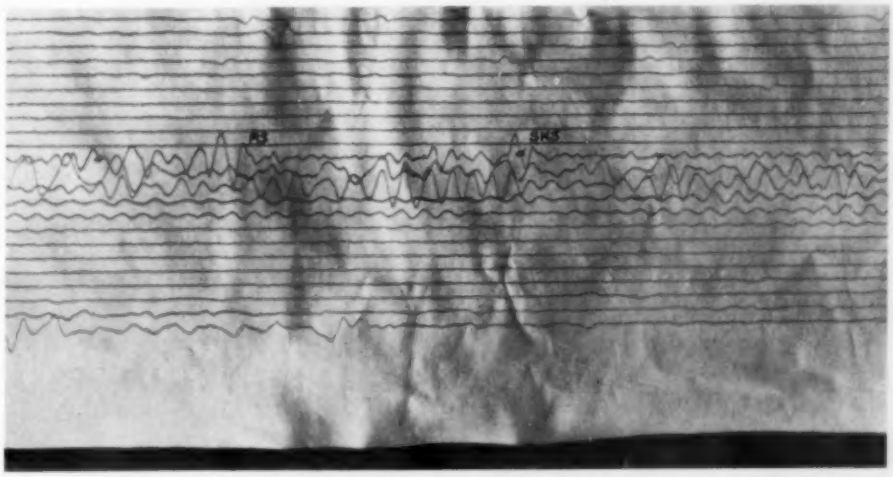

EARTH WRITES OF TRAGEDY

On a seismograph at Georgetown University, Washington, D. C., the earth wrote this record of a severe disturbance thousands of miles away in the Himalaya mountains. Long before news could come from this remote region, scientists were informed by these waves set up by the quake itself and carried through the earth.

PUBLIC HEALTH

Scrap Food and Drug Bill, Amend Old Law, Is Urged

"AN ASTHENIC, chinless and impotent monstrosity"—that, in medical language, sums up what some 92,000 physicians think of the federal food and drug bill as it now stands.

The *Journal of the American Medical Association,* official spokesman of the medical profession, says editorially: (May 31)

"The first bill introduced has been subjected to a sort of plastic surgery which has resulted in a specimen not even resembling the original model and utterly deficient in many particulars.

"Formulas under this bill are secret and filed with the Department of Agriculture. Violations must be carried from the department into the Federal Trade Commission. The procedure is so long and wearisome and the penalties so inadequate that the forces of quackdom may ravage the sick and ailing and retire with their booty long before the processes of investigation and prosecution catch up with them."

The bill is so far from ideal that it had better be scrapped, the medical journal states, and a new beginning made when a more favorable opportunity offers.

Perhaps the best procedure would still be to amend and strengthen the original thirty-year-old pure food and drug law, concludes the *Journal,* by taking account of the need for control over advertising, the great development of the cosmetic industry, and the newer social viewpoint which demands adequate protection for the uninformed consumer.

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OCEANOGRAPHY

Coast Line of Long Island Giant Erosion Laboratory

THE entire ocean front of Long Island —120 miles long—has become an outdoor laboratory for the study of beach erosion.

The U. S. Beach Erosion Board, a division of the Corps of Engineering of the U. S. Army, and the Long Island State Park Commission are making the cooperative survey which will study, on the broadest possible scale, the nature and causes of beach erosion. Previously erosion and sand movement studies have been designed to aid or solve some specific situation.

Four times each year, and as soon as possible after severe storms, underwater profiles are made by the field staff. These profiles are graphs made from depth data along lines that run from the beach out to sea for distances 4,000 to 5,000 miles offshore. Taking successive studies it is possible to see how the ocean bottom is changing with time and is altered by known storm conditions.

Water samples and sand samples form another part of the project. The former are samples from which the quantity of sand in suspension can be determined and the latter consists of samples of sand composing the ocean bed.

An auxiliary study consists of current readings showing the speed and direction of currents along shore which can pile up sand in one place and remove it from another. Subsurface floats are used where the water is over two feet deep. For depths shallower than two feet surface floats and colored liquids are dropped into the water and their movement watched and measured.

Aerial photographs and borings of the bottom to determine its basic nature are also part of the program, says *Shore and Beach,* quarterly journal of the American Shore and Beach Preservation Association.

Science News Letter, June 6, 1936

GENETICS

Noted American Scientist To Direct Soviet Science

ONE of America's leading biologists, Prof. H. J. Muller, has resigned from the faculty of the University of Texas, and will become director of research in genetics in the U.S.S.R. Prof. Muller has been in Moscow for the past three years, working at the Moscow Academy of Science. His most recently published research was carried on jointly with a prominent Russian woman scientist, Dr. A. A. Prokofyeva.

Dr. Muller achieved fame among scientists in this country by his pioneer work in changing the course of evolution by bombarding the germ-cells of organisms with X-rays. In recognition of this research development, the National Academy of Sciences of the United States in 1931 elected him a member, which is one of the highest honors an American scientist can receive. Other workers in genetics, both in the United States and abroad, have since greatly extended the scope of Prof. Muller's X-ray genetics work, and practical applications are being made of it in plant and animal breeding.

Science News Letter, June 6, 1936

IN SCIE

BOTANY

Botanist to Complete 150 Year Old Research

BOTANIZING over a gap of a century and a half, on preserved plant specimens that have crossed the ocean twice, is to be the unique task of Paul C. Standley of the Field Museum Herbarium.

Approximately, 7,000 plants, collected in Mexico while that country was still a Spanish colony, have lain untouched in the vaults of the Botanical Garden of Madrid, while wars and revolutions swept the earth above them. Through all Spain's turbulent modern history, no adequate examination of these rare specimens has been possible.

Now, because Mr. Standley has made a special study of the botany of Mexico and the Middle Americas, the Spanish authorities have entrusted him with the task of identifying and describing the specimens. The main collection will eventually be returned to Madrid, but the Field Museum will be permitted to retain some of the plants.

Science News Letter, June 6, 1936

CHEMISTRY

New Gas Treatment Saves Oranges from Molds

GREEN and blue molds, two of the most destructive enemies of oranges, lemons and other citrus fruits in storage and transit, are successfully combated by means of a new gas treatment, developed by Dr. L. J. Klotz, of the University of California Citrus Experiment Station.

The gas is nitrogen trichloride. Comparatively brief exposures to very small quantities of it have proved deadly to the mold fungi, reducing spoilage from 50 to 75 per cent. Chlorine alone is an effective control on the molds, but unfortunately it also harms the fruit.

Dr. Klotz has experimented with other chlorine compounds, notably two of chlorine with methyl-amines. These, he reports, give promising results from the technical side, but as yet are considerably more expensive than the nitrogen trichloride.

Science News Letter, June 6, 1936

IEE FIELDS

MEDICINE

Urge New Specialty In Medicine of Future

NEED for evolution of a new specialty, that of medical sociology, was pointed out by Dr. R. R. Spencer, U. S. Public Health Service, at the meeting of the National Conference of Social Work at Atlantic City.

Physicians, social workers and public health nurses would meet in this field which Dr. Spencer termed a "borderland science." They would study the relation of social conditions to health and disease, and work out measures, both medical and social, for improving health. Dr. Spencer compared this new specialty with such established ones as radiation-genetics and economic entomology.

Dr. Spencer heads the newly organized office of public health education in the scientific research division of the U. S. Public Health Service.

Science News Letter, June 6, 1936

MEDICINE

Aid Found for Sufferers From Bleeder's Disease

AN EXTRACT which has proved useful in treating hemophilia, the hereditary bleeder's disease, sometimes called the curse of the Hapsburgs, was reported by Drs. R. Cannon Eley and Charles F. McKhann of Boston at the meeting of the American Academy of Pediatrics.

The extract is a brown, turbid material obtained from the placenta, the same maternal tissue from which Dr. McKhann obtained a substance effective in controlling measles.

This new extract differs from the one for measles, however. It helps hemophilia patients because it makes their blood clot faster. In bleeder's disease the patients are in danger of bleeding to death from even a small cut because their blood clots so slowly.

The new extract has been given to 18 patients, Dr. Eley reported. In 14 of them the blood from the veins, following treatment, clotted as rapidly as that of normal persons. The extract has been of more help in children than in adults.

It is given by mouth, usually at midnight or in the morning before breakfast, and ice-cold alkaline carbonated water is given before and after the dose of placental extract. The patient is not allowed to eat anything for several hours afterward.

The exact dose and frequency of treatment has to be determined for each patient, it appears from Dr. Eley's report. Besides its use in hemophilia, the placental extract has proved useful in checking hemorrhage after mastoid and adenoid operations and certain procedures in plastic surgery. In these cases the extract is applied to the bleeding wound instead of being given by mouth.

Science News Letter, June 6, 1936

ASTRONOMY

Chance in Million Another Planet Will Damage Earth

THE CHANCES were only about one in a million that the famous baby planet, Anteros, would strike an inhabited portion of the earth when it made an unprecedented close approach of 1,200,000 miles to the earth last Feb. 7.

Astronomers and laymen can be reassured by the calculations Prof. C. H. Smiley and Ward Crowley of Brown University reported (*Science,* May 8) which provide an antidote to the "sad stories of what might have happened if the planet had struck the earth."

Only sixteen of a million bodies coming to within a million miles will strike the earth, their figures show, and about 73 per cent will fall in oceans or seas and 23 per cent in sparsely inhabited territory. Thus only one in a million is likely to do damage.

It is impossible to predict just where the little planet is going and when it will return to the earth's neighborhood, because it will be pulled about by other planets as well as the sun. If the sun were its sole gravitational attraction it would come back close to earth in 1938. But the Brown University scientists counsel: "Don't worry too much about your safety on earth."

Suppose the little planet, about the size of a small earthly mountain, did hit. It is fortunate that it is moving around the sun in the same general direction as the earth and would not hit head-on. With a rear-end collision the relative speed would be only 4 miles a second (14,400 miles per hour) instead of the 40 miles per second (144,000 miles per hour) for a real head-on conflict.

Science News Letter, June 6, 1936

ARCHAEOLOGY

Oregon Forests Believed Inhabited 15,000 B. C.

TWO stone knives, hidden deep, have come to light and are pronounced evidence that man roamed forests of Oregon over 17,000 years ago.

Estimate of the age when the knives were made by human hands and used in the American wilderness has been reached by Dr. L. S. Cressman, professor of anthropology at the University of Oregon.

Dr. Cressman made excavations at the spot where the knives were found by U. S. Reclamation Bureau survey workers. No additional objects have been found, he reports, but the examination satisfies him that the stone knives were not buried from above, but belonged to the stratum of earth which came in time to be covered by two feet of pumice and three feet of yellow soil and gravel.

"The knives are made of obsidian which has become highly devitrified," says Dr. Cressman's report. "They show a primitive quality of workmanship roughly approximating late Mousterian of early Aurignacian."

In Europe, this type of Stone Age culture prevailed 35,000 to 50,000 years ago, when man hunted cave bears, wild horses, and woolly rhinoceros. In America, Dr. Cressman emphasizes, even if the implements were exactly of the European types, they would not necessarily be equally old. He concludes that "an estimate of 15,000 and more years before Christ might not be far wrong."

Science News Letter, June 6, 1936

METEOROLOGY

Drought Shifts as Dust Bowl Turns to Mud Bowl

DROUGHT has shifted suddenly from Southwest to Southeast, as rains have turned the famous "dust bowl" to a mud bowl, but have failed to fall in a wide area extending from central Virginia to central Alabama, where moisture is now badly needed.

This shift in the season's precipitation crisis was disclosed by the U. S. Weather Bureau's weekly crop weather survey. Except for a few restricted areas in extreme western Texas and where Kansas and Colorado touch corners, the Southwestern drought has been "completely relieved," and with it the danger of widespread dust storms.

Science News Letter, June 6, 1936

POPULATION

Will Old Age Rule?

Estimates Indicate That, by 1980, Twenty-Three Per Cent of Americans Will Be of Pensionable Age

By MARJORIE VAN DE WATER

WILL the Government budgets and tax programs of the future be dictated by an old age lobby?

Will the United States be run by men and women past the retirement age who hold power by their clutch on the purse-strings of the nation?

Will the old-age pension, started as means of lifting the dark shadows of poverty from the twilight days of America's aged, prove to be an "Old Man of the Sea" growing into a crushing burden on the backs of the producers of the nation?

These are some of the questions raised by new predictions based on statistics of the population.

By 1980, before your little boy is old enough for retirement, 23 per cent of the men and women in the United States will be 60 years old or older. Out of every hundred men, women, and children, 23 will be past the retirement age.

This estimate is not just a guess. It was not plucked out of the mists of visionary conjectures.

It is based upon facts and figures and statistical trends of birth and death rates in the nation. It was calculated by the practical-minded statistician-vice-president of the Metropolitan Life Insurance Company, Dr. Louis I. Dublin, who is constantly making such estimates as a basis for fixing life insurance rates.

Land of Aged

Here are the figures showing how America is progressing toward becoming a land of old people:

In 1900: Total population, 75,794,000—over 60, 4,872,000 or 6 per cent.

In 1930: Total population, 122,681,000—over 60, 10,385,000 or 8 per cent.

In 1960: Total population, 150,000,000—over 60, 27,000,000 or 18 per cent.

In 1980: Total population, 150,000,000—over 60, 34,500,000 or 23 per cent.

After about 1960, it is estimated that the whole population of the United States will remain stationary for a period and then will decline. Dr. Dublin, at least, sees no reason at present to expect the nation to continue to grow in numbers after 1960 although the number in the old age group will go on increasing. These figures are based, of course, on the present trends in immigration and in birth and death rates.

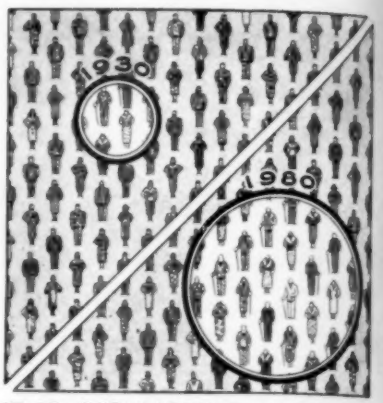
If the popularity of the Dionnes or some other influence causes a return of the large family, this will upset the calculations and bring new youth into the nation. This is at least a fairly possible thing if three present lines of social development are continued. These are, first, the improvement of the economic status of the farmer; second, the drift to suburban and sub-rural ways of living by all classes of industrial employees and business men; third, the increase in importance, and in area occupied, by outdoor professions.

More Room

All these tendencies, if continued, will give people more elbow room. And children sprout in the open, like young plants. Be it remembered that the Dionne family lived in a space hewn out of the woods, and that Mrs. Dionne had already had a sizable family of five children before she went in for "quintity" production.

On the other hand, if the unforeseen achievements of medicine in the future should make it possible to lengthen the span of human life from the Biblical "three score years and ten" to 80, 90 or even 100 years, then the old people might very well outnumber those of working age. Schoolhouses might be turned into refuges for the elderly, playgrounds into golf courses, gymnasiums into clubhouses where graybeards might exchange reminiscences and play checkers.

So far, the extension of the human life-span has shown effect chiefly among the younger members of the human family. More babies are surviving infancy than in past years. More children are living to grow up, spared from the toll of diphtheria, scarlet fever, whooping-cough, and measles. But those who survive to old age are not likely to live to be much older than the old men of past decades. More people die at 75 than at any other age.



IT IS ESTIMATED THAT IN 1980 THERE WILL BE APPROXIMATELY 2½ TIMES AS MANY PERSONS OVER 60 IN PROPORTION TO THE TOTAL POPULATION AS THERE WERE IN 1930

At present the lowering of death-rates from the diseases of the young is paralleled by an increase in deaths from cancer, heart disease, hardening of the arteries, and other diseases of the old. Until physicians have been able to conquer these ills—until they have found some way to keep the human machine from becoming old and wearing out, the Biblical measure of a man's days will still be as true as it ever was.

Somewhat more conservative than Dr. Dublin's figures, but still impressive, is the estimate made by President Roosevelt's Committee on Economic Security. Their figures were based on a retiring age of 65 rather than 60, because the provisions in the social security act set 65 as the retirement age.

The number beyond that age will double in the next 35 years, they figure. Today 7,500,000 persons are in that age group. By 1970, the number of the aged will be increased to more than 15,000,000, according to the Committee's estimate.

Also in agreement that Uncle Sam is rapidly growing older are the population experts, Drs. Warren S. Thompson and P. K. Whelpton. Here is the picture of America's future as presented by these investigators of the Scripps Foundation for Research in Population Problems, Miami University, Ohio. We'll drop the odd hundreds and thousands and talk in millions only.

In 1900, there were 5 million old people over 60, 32 million of working

age (20 to 50 years) and 34 million children (birth to 19). In 1930, 10 million old people, 54 million of working age, and 48 million children. In 1960, there will be 21 million old people, to 67 million of working age and 44 million children. In 1980 we may expect 28 million old people to 66 million workers and 42 million children.

Greater Gain for Old

The number of old people will have jumped up, according to these conservative estimates, from 5 million to 28 million at the same time that the children make the small gain from 34 to 42 million. Worse than that, the trend for the children is now upward, but after 1960 it will be going down. Each year our schools will have a smaller number of youngsters, the playgrounds will be gradually less and less crowded.

Put into percentages, or in proportion to the total population, the figures are even more striking. Back in the horse-and-buggy days at the beginning of the present century—within the memory of many of us—each hundred people that you might meet on the street would include six old people and 44 children. In 1930, within the present after-the-market-crash era, the crowd would have changed somewhat. Then two more old people had joined the group, making eight elders, and they were accompanied by only 39 children—a loss of five.

In 1960, look what will have happened. Then there will be 14 old men and women, and they will bring with them only 29 children.

And in 1980! Then you will see 18 old people with only 27 children. We shall have lost 17 of our children and have gained 12 old people in each crowd of 100, throughout the nation.

What is happening to the working group, meantime? What are the comparative numbers of those who must support both the old and the young?

These people are not increasing in proportion to the burden they must bear. In 1900, there were 42 in each crowd of 100 that were of the best producing ages—from 20 to 50 years. In 1980 there will again be just 42. Just now the proportion of those of working age is increasing a little, but soon it will again go slowly down, because for each child lost, later on a young adult will be missing from his place at desk or machine.

Double Burden

Today we have about five persons of producing age to support one old man or woman. By 1980, the same number of workers will have two old people to support.

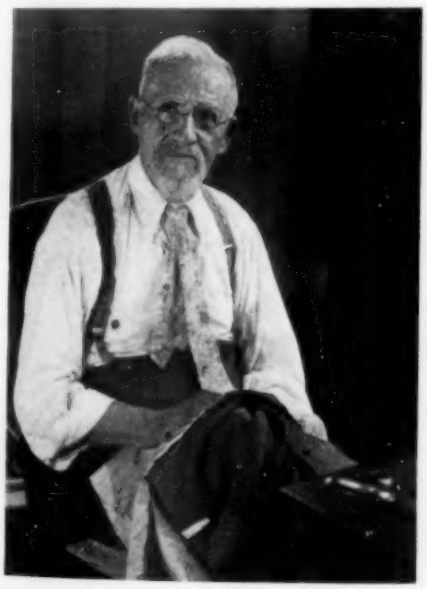
The question has also been raised as to whether these workers will have more earning ability by the time 1980 rolls around. The answer suggested by the statistics is that on the contrary they may have less.

Unfortunately, that fateful bird, the stork, is not impartial as is the rain from heaven in coming down upon the homes of America. It may descend alike on the just and the unjust, but it certainly has a strong preference for the unfortunate.

The birthrate of young married women on relief is 69 per cent higher than the rate for wives in the self-supporting groups of low income, it was revealed by a survey conducted by the U. S. Public Health Service and the Milbank Memorial Fund.

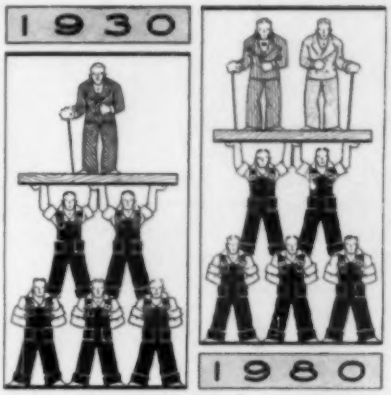
When this fact was published recently it was received with consternation by many who seemed to feel it to be an expression of ingratitude on the part of those on relief.

The fact is that being placed on relief did not increase the birthrate for these people. In the contrary, the birthrate for this group has actually declined since the depression, just as has the birthrate for the rest of the population.



A PRODUCER

This 90-year-old tailor, John Lehner of Des Moines, Iowa, still does fine sewing eight hours every day. He can take off his glasses and thread a fine needle, ten times out of ten. Under an old-age-pension plan like the Townsend plan he would have been retired for the last 30 years, living on the labor of others.



THE SAME NUMBER OF WORKING PERSONS WOULD HAVE TO SUPPORT TWICE AS MANY OLD PERSONS IN 1980 AS IN 1930

But those who have large numbers of hungry child mouths to feed—those with a tradition of frequent births and large families—those are the ones likely to be the first to feel the pinch of bad times and be forced to cry for help.

It seems that those blessed with the highest biological survival value have this blessing mixed with a strong tendency toward low social and economic survival value.

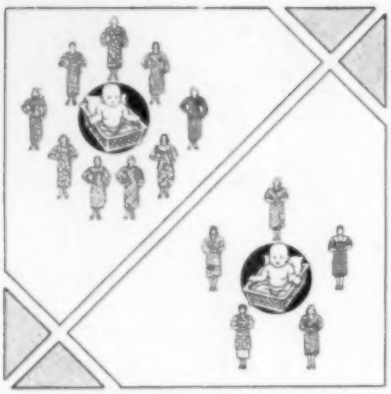
This same survey of the U. S. Public Health Service and Milbank Memorial Fund reveals that they are apt to be chronically poor, or at least on the borderline where a depression can easily push them from their precarious foothold in the "moderate circumstances" class.

They are subject to frequent and numerous illnesses in the family. They have a high deathrate. They are long and often out of jobs.

Not only does the stork choose for his alighting place the most unfortunate homes in the community, but he also descends much more often in the poorest communities.

When the various parts of the United States are graded according to a sort of cultural-intellectual index, it is found that the poorest communities produce the greatest numbers of children. Among the unintelligent and uncultured are born most of America's future citizens.

The cultural-intellectual index, based on intelligence tests, circulation of magazines, proportion of the population listed in "Who's Who," the proportion who are illiterate, and inaccuracies in the Census, was used by Frederick Osborn, population expert of New York City, for comparison with the rate of increase or decrease in the population. Largest population increases are now



THE BIRTHRATE AMONG WOMEN OF OUR FINANCIALLY INDEPENDENT GROUP IS 1 CHILD TO EVERY 9 MARRIED WOMEN, WHILE THAT OF THE DEPENDENT POPULATION IS 1 CHILD TO EVERY 5 WIVES

coming from areas where the cultural-intellectual level is lowest, he found.

Moreover, the least formal schooling is being given to those children who, in the future, are going to raise the largest families.

And America is growing fastest in those communities where it is hardest to earn a living—where the economic level is nearest the bottom. Dr. Carter Goodrich, Washington expert, in his study of population redistribution, found that in the poorest counties the number of children compared to the number of women of child-bearing age is 63 per cent above the national average. In the richest counties, the ratio of children to potential mothers is 25 per cent below national average.

Profound Changes Ahead?

Thinking men and women are now speculating as to the effect of these profound changes in the population and present trends toward an aging people, a non-growing people, and possibly a less intelligent, less self-sufficient and economically independent people.

It may very well be that America is due to lose her progressive outlook on world and domestic affairs, that her young men of initiative and ability may be hampered by a control from conservative, non-producing, parasitic elders who with certain income and enforced leisure have naught to do but exercise their power over the young.

Some suggest that relief from poverty and sufficient money for medical attention will bring happiness to the pensioners and add to their twilight years. The fifth of the ten commandments reads: "Honor thy father and thy mother that thy days may be long in the land." It is urged that if this "honor" takes the form of an old-age pension, it may be that the parents, too, will have their days lengthened.

Idleness Means Death

But others say that to stop work means death.

An interest in life seems to be important somehow to continued living. The person who suddenly realizes that the world has no longer need for him receives a mental blow that may indeed prove fatal. Certainly if active, intelligent, healthy men and women are forced into idleness, pushed from productiveness into a life of "sponging," the physician will have need for a new knowledge of mental hygiene. The world will have new necessity for training in the use of leisure.

In California, birthplace of the Townsend plan, lives a psychologist who is an outstanding authority on mental health in the aged. In 1916, two decades ago, Dr. Lillien J. Martin was retired from her position as professor of psychology at Stanford University. But she was not the sort to sit idle. That was really the beginning of her career —it was then that she began her pioneer study of old age. At the age of 78, she published her outstanding book on *"Salvaging Old Age."*

Dr. Martin has little sympathy with those who would toss the aged onto some human scrap heap as "useless machinery" or "lay them on the shelf." With vividness she paints the misery of idleness and uselessness for the aged.

"The portrait of Whistler's *Mother* fills one with despair," she writes. "It is a presentation of the old who have given up and are content to sit, having been beaten by life and grown indifferent through defeat."

WHAT WOULD BE THE ACTUAL EFFECT OF ENFORCED LEISURE UPON ALL PERSONS OVER 60? WOULD IT MEAN NEW LIFE, OR DETERIORATION — AND DEATH?

"Industry will have to take on new ideas regarding the old, as the old will have to look with new eyes on the industrial world" is her comment on the practice of retiring at a certain age, regardless of fitness.

Those few who are happy in old age are the ones who have found consciously or haphazardly their ideal working niche, the one in which they can use the full measure of their capacity and which they find so absorbing that the interest in their cause or subject carries them beyond a personal or subjective outlook, Dr. Martin concludes.

Predictions Impossible

Life insurance actuaries are unable to predict what effect the old-age pension will have on the life span and the age composition of the population.

"It may be that freedom from financial worries and the means to pay for medical attention will have a beneficial effect," Dr. Dublin said in answer to a question on this problem.

"On the other hand it might be that loss of interests and loss of responsibilities attendant upon retirement, together with idleness, would breed an unhealthy mental state possibly aggravating illnesses or leading to carelessness of life and accidental deaths."

Statisticians do not now know what the sickness or deathrate is among persons retired on pensions.

"Such reports on the mortality of retired teachers, policemen, or firemen as have been published can hardly be used as a basis for judging what the effect of old-age pensions will be on the general population," Dr. Dublin pointed out.

"It is difficult, at this time, to do more than consider the possibilities."

This question mark as to whether a luxurious old-age pension would be a blessing or a menace may be added to the other problems of increasing numbers of old, fewer men and women of working age and lowering of earning ability. Together they form a challenge to the thinking people of America.

Science News Letter, June 6, 1936

The Indians of the United States are increasing, and it is foreseen that in a hundred years there may be as many Indians as in ancient times.

Research has succeeded in making shockproof X-ray tubes of 200,000 volts, which are pronounced as safe electrically as an ordinary lamp.

AVIATION

Airplane of 1940 Envisioned By British Air Expert

BY 1940 aircraft engines will develop at least 1,600 horsepower in a single engine unit, it was predicted by the British aeronautical engineer, H. Wood, of Rolls-Royce, Ltd., before the meeting of the Society of Automotive Engineers in White Sulphur Springs.

By special invitation of the Society, Mr. Wood came from England to present recent advances in the art of cooling airplane engines with liquids—either water or the newer glycerine compounds.

Wherever modern airplanes are flown, cooling is a major problem, for in many cases airplane engines already overheat if operated on the ground for any length of time. Only at the high velocities of cruising flight is sufficient air drawn over the engine to give proper cooling. Liquid cooling used in the best English airplanes is in sharp contrast to the common American practice of using air-cooled engines.

The engine of high horsepower in the future, Mr. Wood intimated, will probably consist of many small cylinders to take advantage of the relatively increased cooling surface thus attained.

British aircraft engines—at least the major part controlled by Rolls-Royce—will continue to be liquid cooled in the future, Mr. Wood maintained. His invitation to speak, he declared, had been accepted in the spirit of a friendly challenge.

It has only been since the adoption by air-cooled engine manufacturers of the special engine cowling devised by the U. S. government's National Advisory Committee for Aeronautics that British airplane engine producers had had to worry greatly about the development of liquid-cooled engines.

Previously the small front area of "in-line" liquid-cooled engines gave a smaller air drag than the much larger radial air-cooled engines. With the cowling, however, air drag has become essentially comparable for the two contrasting engine types. Thus the liquid cooling advocates have had to revise their concepts.

Progress in English liquid-cooled engines, Mr. Wood admitted, has not been as spectacular as the American developments in air-cooled aircraft engines. The rapid development of civil aviation in America has been instrumental in this fast development.

By contrast, the British authority pointed out, civil aviation in England is comparatively small and most engines have been built for the British Air Ministry for military purposes. The Air Ministry has maintained a balance between air-cooled and liquid-cooled engines resulting in the keeping of technical advantage to both.

Science News Letter, June 6, 1936

ARCHAEOLOGY

Learn China's History From Ancient Oracles

THE early history of China's mysterious Shang Dynasty, 1500 B.C., is being revealed by an ancient Chinese oracle.

Importance of new discoveries connected with this oracle, in the Honan Province of northwestern China, was emphasized by Dr. A. R. Radcliffe-Brown of the University of Chicago, speaking before the central section of the American Anthropological Association meeting in Evanston, Ill.

Heretofore vaguely known by historical writings recorded long after the events happened, the Shang Dynasty is now speaking for itself, through contemporary writings. These writings, described by Dr. Radcliffe-Brown, are questions that early Chinese emperors inscribed on tortoise shell or bone, and brought to official diviners. By applying heat to the shell or bone, the diviner interpreted the cracks that formed from the heat, and answered the questions accordingly.

The questions of the Emperors and others are very revealing, as to the state of affairs in that ancient time in China. The oracle was questioned regarding wars, planting of crops, and other important matters, and since there was no reason to exaggerate or distort the truth, scholars are at last checking up on the extravagances and doubtful features ascribed to that period.

The inscriptions are serving as new sources of information for the study of ancient forms of the Chinese language, Dr. Radcliffe-Brown also reported.

Science News Letter, June 6, 1936

ORNITHOLOGY

NATURE RAMBLINGS by Frank Thone

Fishers With Dip-Nets

MISTAKEN notions still prevail about the function of the pelican's beak. Even now, probably, a majority of people accept the dictum of the ancient profane limerick, that "he can store in that beak enough food for a week."

Actually, the pelican stores nothing in his capacious pouch. What he catches he swallows. At the home nest, the young pelicans are regaled with fish regurgitated from the parental stomach. Messy, no doubt; but the pelicanlets don't seem to mind.

What, then, is the pelican's pouch used for? Simply as a dip-net, a necessary fishing implement, ornithologists tell us. Pelican Pete, sailing his majestic way over the waters, sees a fish. Swoop! goes his head, with the big-pouched beak distended. And the fish is caught exactly as with a dip-net.

White pelicans, which live exclusively in the West, are surface fishers. They swim along, seeking their prey as they go. Sometimes a whole row of them will go fishing at once, driving a school of fish before them with a great beating of wings and dipping up every one that comes close enough to the surface.

Brown pelicans, which are the common Eastern and Southern species, fish on the wing. When one sees a fish within grabbing distance of the surface, he makes a nose-dive for it, beak open, and scoops it in. The pouch of the brown pelican, which thus depends more on marksmanship than on a wide sweep of the net, is much smaller than that of the white pelican.

Colonies of pelicans that winter in Lower California waters sometimes have their nesting places where you would least expect them. One group nests on a couple of tiny islands in Yellowstone Lake, about 7,500 feet above sea level.

But fishing is very good in the lake, which is crowded with trout.

Another colony of pelicans nests on an island in Great Salt Lake, where there are no fish at all, because of the extreme saltiness of the water. To do their fishing, these birds must fly to the streams and smaller freshwater lakes of the region, and then wing the long way home to feed their young.

Science News Letter, June 6, 1936

CHEMISTRY

Sponge Made by Man Rivals Nature's Product

A MAN-MADE sponge that may prove to be superior in many ways to the natural product is a new achievement to be added to those of the chemist. The sponge is manufactured of highly purified wood and cotton cellulose, resembles a cake of Swiss cheese, its spongelike appearance being due to chemical reactions, and can be employed for all purposes to which sponges are ordinarily put.

The new synthetic sponge is tough and durable but becomes quite soft and pliable when wet, thus precluding any possibility of scratching the most highly polished surface. It will outlive the natural product, states a report (*Industrial and Engineering Chemistry*). This man-made sponge is resistant to cleaning compounds, soaps, greasy matter, and grit; is uniform in quality, size, shape, and texture; is free from odor and, since it floats, does not pick up grit and other foreign matter. It can be trimmed to any desired size without damage to its texture or durability, and can be used for washing, polishing, and drying almost any surface without the aid of towels or chamois. The duPont Cellophane Company of New York is the first to manufacture the sponge in the United States.

Science News Letter, June 6, 1936

PHYSIOLOGY

Noise Blamed for Many Evils At Meeting of Deafened

AN ALL-ROUND indictment of noise, as harmful to health, happiness, and the pursuit of a living, was made by Dr. W. R. Barss at the conference of the American Society for the Hard of Hearing in Boston.

Dr. Barss, physicist and technical member of Boston's noise commission, cited experiments to support his denunciations.

"Statistical analysis in New York City," he said, "reveals the fact that a large percentage of automobile and taxi drivers are partially deaf, and that this percentage is increasing, and the same is known to be the case among laborers or mechanics exposed to constant noise."

Possibility that noise is playing a definite part in the mounting toll of deaths due to diseases of the circulation, particularly heart disease, was suggested by the speaker.

In experiments, a popping firecracker raised systolic blood pressure. A telephone bell was found to speed up the heart rate. Effects of noise on pressure within the skull have been tested by bursting a blown-up paper bag, and this sharp sound raised the brain pressure to four times the normal for seven seconds.

Increased pressure within the skull, he explained, means an increased circulation, and that in turn calls for an increased amount of work on the part of the heart.

Using mice, instead of men, in laboratory experiments, it has been learned that white mice exposed to noise eat five per cent less than those eating in quiet, and growth is retarded ten per cent, as compared with the mice protected from noise. These experiments, Dr. Barss declared, probably have a bearing on what goes on in human beings under similar conditions.

Continuing his indictment of noise, as bad for mind and body, Dr. Barss said that it causes fatigue, thereby shortening years of efficiency; increases accidents; possibly aggravates crime psychology; and interferes with the joy of living.

As early as 720 B.C., the city of Sybaris in Italy had regulations prohibiting industrial noise in residential areas, Dr. Barss has found by digging into history, but it has remained for the present era to become noise-conscious, and to try to find out what noise actually does.

Conditions Improving

Conditions for the deafened have greatly improved in the past 15 years, Miss Josephine Timberlake, superintendent of the Volta Bureau at Washington, reported. Use of lip reading as an aid in conversation is increasing. Such devices as the audiometer and "field fones" have passed the stage where they seemed "thrilling experiences" to the hard of hearing. Stronger efforts are being made to prevent loss of hearing, to conserve what is left, and to prevent voice control from deteriorating in individuals who cannot well hear their own speech.

Science News Letter, June 6, 1936

ARCHAEOLOGY

Nature, Not Man, Made Mummies in Island Cave

NATURE, not man, preserved New Guinea's mysterious group of human "mummies," found sitting knees-to-chin in a long cave in the Morabe goldfields district.

With this verdict, two British scientists have apparently upset the earlier pronouncement on discovery of the mummies, that New Guinea natives once knew how to mummify bodies as the Egyptians did, and perhaps learned the art from distant Egypt itself.

The mummies appear to be dried-up, not embalmed, declares E. L. Gordon-Thomas, reporting to the scientific journal, *Man*. Conditions in the limestone cave, high above the sea, served to dehydrate the bodies, is the supporting view of Dr. E. T. Brennan, principal medical officer of New Zealand.

Finding the light-skinned corpses—over 60 of them—may shed considerable light on problems of New Guinea anthropology, Mr. Gordon-Thomas believes. The ancient chapters of New Guinea's habitation by man have been little probed. Present day natives cannot explain the burial customs that mummies of the cave tomb represent, nor can the natives show how people would handle and use the huge stone pestles and mortars which have been found in this area.

Science News Letter, June 6, 1936

•First Glances at New Books

Ethnology

WE EUROPEANS, A SURVEY OF "RACIAL" PROBLEMS—Julian S. Huxley and A. C. Haddon—*Harper,* 246 p., $2.50. Branding racialism a myth, authors of this volume go back to biological facts and explain why "racial purity" is impossible of attainment. Mixture of ethnic types in the past has been beneficial, it is pointed out, though it does not necessarily follow that human mixtures would always be good. Just to remind the reader how nonsensical are stereotyped notions of what an American, German, Norwegian, or Russian ought to look like, there are 16 portraits of various nationals in the front of the book, and he can check his guesses with answers in the back.

Science News Letter, June 6, 1936

Psychology

PRINCIPLES OF ANIMAL PSYCHOLOGY —N. R. F. Maier and T. C. Schneirla—*McGraw-Hill,* 529 p., $4. The field in which this work is designed to serve as textbook is of importance not alone because of interest in the behavior of the infra-human animals, but because knowledge of the infra-humans provides a foundation for the study of human psychology. The laboratory rat, the cat and the monkey are freely used as subjects in psychological experiments that would not be practical on human "specimens." The student of psychology must know animal psychology in order to judge the extent to which such experiments may find application in human psychology.

Science News Letter, June 6, 1936

Physics

MECHANICAL PROPERTIES OF MATTER — S. G. Starling—*Macmillan,* 336 p., $2.10. A British text, "intended for students preparing for Higher School Certificate, or Intermediate Examinations in Physics" in English universities.

Science News Letter, June 6, 1936

Physical Education

ACHIEVEMENT SCALES IN PHYSICAL EDUCATION ACTIVITIES FOR COLLEGE MEN — Frederick W. Cozens — *Lea & Febiger,* 118 p., $2.50. Athletic ability tests, for colleges.

Science News Letter, June 6, 1936

Philosophy of Science

LA PRÉVISION HISTORIQUE DANS LA NATURE—J. Delevsky, 53 p., 12 fr.; LA MÉTHODE DANS LA MÉCANIQUE DES QUANTA—M. René Dugas, 59 p., 12 fr.; LA LOGIQUE ET L'EMPIRISME INTÉGRAL—Julien Pacotte, 55 p., 12 fr. —*Hermann & Cie., Paris.*

Science News Letter, June 6, 1936

Anthropology

MEASURES OF MEN—Harold Cummins, Mary S. Lane, Stella M. Leche, Ruth Millar, Inez D. Steggerda, and Morris Steggerda—*Dept. of Middle American Research, Tulane Univ.,* 331 p., $5. The scientific specialty of dermatoglyphics is the central theme of this volume of ten studies. The reports deal with Indians of Mexico, Central America and the Indies, showing characteristic finger and palm print patterns, data on right and left handedness, and other related evidence valuable in study of differences among races of man. One chapter by Dr. Cummins discusses critically methodology in palmar dermatoglyphics.

Science News Letter, June 6, 1936

Psychiatry

AN ENQUIRY INTO PROGNOSIS IN THE NEUROSES—T. A. Ross—*Cambridge (Macmillan),* 194 p., $3. Based on a study of nearly twelve hundred patients, observed over a period of several years.

Science News Letter, June 6, 1936

Physics

A SURVEY OF PHYSICS FOR COLLEGE STUDENTS — Frederick A. Saunders — *Holt,* 679 p., $3.75. Revised edition of a successful college text.

Science News Letter, June 6, 1936

Anthropology

STUDIES OF THE YAQUI INDIANS OF SONORA, MEXICO—W. C. Holden and others—*Texas Technological College* (Bulletin, vol. XII, no. 1), 142 p., 60c. Distributed by Tech Bookstore, Lubbock, Texas. An exceptionally interesting group of reports about the life of a tribe widely known to the public, by name at least. Aside from a paper on the physical traits of these Indians by Dr. Carl Seltzer, the accounts are intentionally written for the layman and student, rather than for the professional scientist.

Science News Letter, June 6, 1936

Military Medicine—History

FROM A SURGEON'S JOURNAL—Harvey Cushing—*Little, Brown,* 533 p., $5. The author of this book is a distinguished American surgeon whose well-known skill as a writer is apparent even in the informal pages of a diary. This volume represents part of the journal he kept during the World War when he served first with a Harvard Unit in the American Ambulance during 1915 and again at various posts from May, 1917, until February, 1919. It is wartime history with a medical flavor, but Dr. Cushing did not confine himself to a record of the surgery he saw and performed. Vivid thumbnail sketches of persons and places and episodes brighten the pages. The book will appeal largely to masculine readers, particularly medical men to whom the names as well as technical terms are familiar.

Science News Letter, June 6, 1936

History of Science

TRAIL BLAZERS OF SCIENCE—Martin Gumpert—*Funk & Wagnalls,* 306 p., $2.50. This book tells the dramatic and often tragic stories of a number of pioneer scientists who had to fight bitter opposition by their contemporaries. The book finishes on a more cheerful note with a description of the operative technic of Harvey Cushing, an American surgeon who has had the happy lot of seeing contributions acclaimed while he is living.

Science News Letter, June 6, 1936

Public Health—Economics

BUYERS BEWARE—Beatrice Pitney Lamb—*Natl. League of Women Voters,* 15 p., 15 cents. Need for a revised food, drugs, and cosmetic law is discussed.

Science News Letter, June 6, 1936

•RADIO

June 16, 2:15 p. m., E.S.T.

CRIME LABORATORIES—Dr. William Souder of the National Bureau of Standards.

(No program on June 9 or June 23.)

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

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WATSON DAVIS, *Director.*

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